Abstract

A computer architecture and method for transferring data in the generating and displaying or printing of images having high edge placement accuracy derived from multiply exposures of a plurality of predefined patterns, each having inherently lower edge placement accuracy. The edge placement accuracy achieved can far exceed that normally afforded by the pixel size of the image transducer on which is formed the coarse pattern. The procedure starts with a pattern laid out on a grid finer than, or different from, the grid size defined by the pixel size of the image transducer, which is overlaid by the transducer grid and converted to n different patterns compatible with the transducer grid. When suitably combined by partial exposures that weight the patterns unevenly, the n patterns generate a viewable or recordable image with line edge positions that are a fraction $(1/(2^n-1))$ of the transducer grid size. For most picture display applications and for a step-and-repeat lithography application, the pattern stored in the first memory is displayed or partially exposed once, and the remaining patterns stored in memory are displayed or partially exposed 2^{m-1} times where m is the number of the copy of the pattern. By superimposing 2^n-1 exposures in the time it takes the human eye to integrate a scene, a picture with improved line placement accuracy is perceived. Similarly, superimposing 2^n-1 partial exposures in a photosensitive recording medium will produce an improved recorded image. The present invention is particularly applicable to applications involving the transfer of large amounts of data in a short time interval, such as maskless step-and-repeat and maskless step-and-flash lithography.